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APPLICATION NUMBER: ***60/156,391***
FILING DATE: ***September 28, 1999***

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

INVENTOR(S)

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Robert Vincent	Racunas, Jr.	Oak Hill, Virginia

☐ *Additional inventors are being named on the ___ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

Internet Communication of Parking Lot Occupancy Information

CORRESPONDENCE ADDRESS

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ENCLOSED APPLICATION PARTS *(check all that apply)*

☒ Specification *Number of Pages* 13 ☒ Small Entity Statement

☒ Drawing(s) *Number of Sheets* 3 ☒ Other (specify) Fee Transmittal

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

☒ A check or money order is enclosed to cover the filing fees

☐ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: ____

FILING FEE AMOUNT ($): 75.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No

☐ Yes, the name of the U.S. Government agency and the Government contract number are: ____

Respectfully submitted,

SIGNATURE Robert Vincent Racunas, Jr.

TYPED or PRINTED NAME Robert Vincent Racunas, Jr.

TELEPHONE 703-758-5563

Date 9/28/99

REGISTRATION NO. *(if appropriate)* ____

Docket Number: ____

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C., 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C., 20231.

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INTERNET COMMUNICATION OF PARKING LOT OCCUPANCY INFORMATION

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates generally to Internet communication. More particularly, the present invention relates to Internet communication of parking lot occupancy data.

Related Art

Locating a vacant parking space is often an ordeal that causes frustration for many commuters. Even where a commuter pays to enter a parking lot, valuable time is consumed searching for a parking space within the parking lot. It seems that parking lots that service hospitals, airports, mass transmit stations, entertainment forums, shopping malls and the like are always the most crowded, when time is the most crucial. As urban and suburban regions become more populated, finding a vacant parking space will become increasingly more difficult for commuters.

Several prior art devices have attempted to facilitate locating a parking space. In particular, U.S. Patent No. 5,293,163 to Kakihara et al. ('163 patent) discloses a system for locating garages with available parking spaces. According to the '163 patent, the location of a parking garage having available parking is displayed in map format.

U.S. Patent No. 5,432,508 to Jackson ('508 patent) discloses a technique for informing vehicle operators of available parking spaces in a parking garage. According to the '508 patent, light sources mounted above the parking spaces and at the entrance to

the parking garage are used to indicate the location of available spaces. The '508 patent also discloses a computer which collects information concerning parking availability and communicates the information to prospective users. Namely, a person can call in to the computer via telephone and receive a voice message indicating whether the parking lot is full or not.

U.S. Patent No. 5,910,782 to Schmitt et al. ('782 patent) discloses a system for finding available on-street parking using an on-board vehicle navigation system and parking meters equipped with sensing devices. According to the '782 patent, real time metered parking space information can be accessed from a central location or directly by a vehicle, upon entering a specific geographic area.

U.S. Patent No. 5,940,481 to Zeitman discloses a parking management control system used to report parking, monitor parking and reserve parking spaces. According to the '481 patent, a user reports parking in a particular parking facility to a central control unit using a personal non-dedicated mobile communications device. The central control unit then confirms whether parking in the particular parking facility is authorized or not. The central control unit also generates a report indicating which parking facilities are supposed to be vacant for law enforcement officials so that unauthorized parking can be ticketed. The '481 patent also discloses that a user can reserve a desired parking facility by selecting a desired parking facility from a map provided from the central control unit. The next time a potential user, other than the registered user, wishes to park in the reserved parking facility and communicates with the central control unit, the potential user receives a message that the parking facility is already reserved and not authorized for use.

At present, however, no prior art device utilizes the capabilities of the Internet to display a real-time representation of a parking lot indicating vacant parking spaces.

SUMMARY OF THE INVENTION

According to the present invention, a server transmits parking lot occupancy information over the Internet. Such parking lot occupancy information is capable of being reproduced by a remote display device as a real-time representation of the parking lot indicating vacant parking spaces. The real-time representation may be in the form of a textual listing, a graphical map, a video image, an Internet Web page or similar form. When presented with the real-time representation of the parking lot, a commuter can readily locate an available parking space or decide to search for parking elsewhere.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates a communication network according to one embodiment of the present invention;

Figure 2 illustrates a method according to one embodiment of the present invention; and

Figure 3 illustrates a method according to another embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Figure 1 illustrates a communication network 10 according to one embodiment of the present invention. The communication network includes a controller 11 for

commanding a server 12 to transmit parking lot occupancy data corresponding to one or more parking lots 13, 14 via the Internet 15. For simplicity, only the basic components of the communication network 10 are shown. However, as would be understood by one of ordinary skill in the art, the communication network may include various other components and structures in actual implementation. For instance, although a first parking lot 13 and a second parking lot 14 are shown, the communication network may include only one parking lot or as many parking lots as desired.

As indicated by the broken lines, the controller 11 may be either internal or external to the server 12. The controller 11 may include any type of hardware, software, application or program for commanding the functions described herein and may be embodied in any type of device, computer readable medium or a propagated signal. The controller 11 transmit commands to the server via a first connection 17, which may be any communication path capable of carrying commands between the controller 11 and the server 12.

The server 12 may be any type computer, computer system, server, settop box or other type of Internet accessible device and may include any type of hardware, software, application or program that would be obvious to one of ordinary skill in the art capable of functioning as described herein. The server 12 may be located at the site of one of the parking lots 13,14 or may be located at a remote location. As shown in Figure 1, the server 12 is connected to the first parking lot 13 via a second connection 18. The second connection may be a serial, modem, telephone, cable, satellite, LAN (Local Area Network) including one or more other computers (not shown) or any other connection capable of carrying data between the first parking lot 13 and the server 12. The server 12 is also connected to the second parking lot 14 through the

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Internet 15 via a third connection 19 and a fourth connection 20. The third connection 19 and the fourth connection 20 may be any type of modem, cable, satellite or other type of connection capable of carrying data through the Internet 15 between the second parking lot 14 and the server 12. Each of the third connection 19 and fourth connection 20 may also include one or more intermediary computer systems or servers (not shown), such as an ISP (Internet Service Provider).

The first parking lot 13 and the second parking lot 14 may be any parking lot that services a hospital, airport, mass transmit station, entertainment forum, shopping mall, department store, grocery store or the like. Each of the first parking lot 13 and the fourth parking lot 14 are equipped with detectors (not shown) for detecting the status information for each of the parking lots 13,14. Such detectors may be any type of device capable of ascertaining whether a parking space is occupied or not. The detected status information includes at least the location of vacant parking spaces within the parking lots 13, 14. The status information may, however, include the occupancy status of every parking space within the parking lots 13, 14 or any other information concerning the status of the parking lots 13,14. The first parking lot and second parking lot are also equipped with communication devices (not shown) for communicating the status information to the server 12. Such communications devices may be any type of internal or external device such as a computer, server, application, program capable of conveying the status information to the server 12.

Referring again to Figure 1, the server 12 is connected to a remote display device 16 through the Internet 15 via the third connection 19 and a fifth connection 21. The fifth connection 21 may be any type of modem, cable, satellite or other type of connection

capable of carrying data through the Internet 15 between the server 12 and the remote display device 16.

The remote display device 16 may be any type computer, computer system, server, settop box or other type of Internet accessible device and may include any type of hardware, software, application or program capable of executing the functions described herein. The remote display device 16 may also be portable and may include applications that enable textual or graphical display of information, such as an email application or an Internet browser. Although only one remote display device 16 is shown, many display devices are envisioned. The remote graphical display 16 may be a wired or wireless device structured and arranged to access the Internet from home, office, vehicle or any other location.

The operation of one embodiment of the present invention will now be described with reference to Figure 2.

In response to commands from the controller 11, the server 12 retrieves status information from one or more of the parking lots 13, 14 (S10). This may entail the controller 11 commanding the server 12 to poll or query the occupancy status of the parking lots 13, 14 or commanding the server 12 to accept status information periodically sent from the parking lots 13, 14.

After the server 12 has retrieved the status information, the controller 11 may instruct the server 12 to perform data processing in order convert the status information into parking lot occupancy data capable of being reproduced by a remote display device 16 (S20). Of course, such data processing may or may not be required depending on the form of the retrieved status information.

The controller 11 then commands the server 12 to transmit the parking lot occupancy data over the Internet 15 (S30). The parking lot occupancy data corresponds to

one or more of the parking lots 13, 14 and is capable of being reproduced by a remote display device 16 as a real-time representation of the parking lot 13, 14 indicating vacant parking spaces within the parking lots 13, 14. The real-time representation may be in the form of a textual listing, a graphical map, a video image, an Internet Web page or similar form and may indicate occupied parking spaces as well as reserved parking spaces.

Using a remote display device, a commuter can view the real-time representation of the parking lot and can readily locate an available parking space or decide to search for parking elsewhere.

The operation of another embodiment of the present invention will now be described with reference to Figure 3. In this embodiment of the present invention, the controller 11 commands the server 12 to accept subscriptions from a plurality of subscribers (S100). The controller 11 commands the server 12 to provide Internet accessibility to parking lot occupancy data corresponding to at least one parking lot for the plurality subscribers (S200). Subscribers may access the real-time representation via the Internet by visiting a Web site or transmitting an email request, for example. The server 12 may provide access for a fee. Accordingly, the controller 11 may command the server 12 to appropriately charge and bill subscribers (S300).

Again, the parking lot occupancy data capable is capable of being reproduced by each of the remote display devices as a real-time representation of the parking lot indicating at least vacant parking spaces within the parking lot. The real-time representation may be in the form of a textual listing, a graphical map, a video image, an Internet Web page or a combination of such forms and may indicate occupied parking spaces as well as reserved parking spaces.

As described above, the present invention will facilitate a commutes search for a parking space by utilizing the capabilities of the Internet to display a real-time representation of available parking spaces within a parking lot.

It should be understood that the embodiments described above are only examples of the present invention and are not intended to limit the scope of the following claims.

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What is claimed is:

1. An Internet access~~ible~~ communication apparatus comprising:

a controller for commanding a server to transmit parking lot occupancy data corresponding to at least one parking lot via the Internet to a remote display device, said parking lot occupancy data capable of being reproduced by the remote display device as a real-time representation of the parking lot indicating at least locations of vacant parking spaces within the parking lot.

2. The apparatus of claim 1, wherein said controller commands the server to transmit parking lot occupancy data corresponding to a plurality of parking lots.

3. The apparatus of clam 1, wherein the real-time representation indicates locations of occupied parking spaces.

4. The apparatus of clam 1, wherein the real-time representation indicates locations of reserved parking spaces.

5. The apparatus of claim 1, wherein the real-time representation is a textual listing.

6. The apparatus of claim 1, wherein the real-time representation is a graphical map.

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7. The apparatus of claim 1, wherein the real-time representation is a video image.

8. The apparatus of claim 1, wherein the real-time representation is an Internet Web page.

9. A communication method comprising the step of:

transmitting parking lot occupancy data corresponding to at least one parking lot via the Internet to a remote display device, said parking lot occupancy data capable of being reproduced by the remote display device as a real-time graphical representation of the parking lot indicating vacant and occupied parking spaces within the parking lot.

10. The method of claim 9, wherein parking lot occupancy data corresponding to a plurality of parking lots is transmitted.

11. The method of clam 9, wherein the real-time representation indicates locations of occupied parking spaces.

12. The method of clam 9, wherein the real-time representation indicates locations of reserved parking spaces.

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13. The method of claim 9, wherein the real-time representation is a textual listing.

14. The method of claim 9, wherein the real-time representation is a graphical map.

15. The method of claim 9, wherein the real-time representation is a video image.

16. The method of claim 9, wherein the real-time representation is an Internet Web page.

17. A method comprising the step of:

providing Internet accessibility to parking lot occupancy data corresponding to at least one parking lot for a plurality of remote display devices, said parking lot occupancy data capable of being reproduced by each of the plurality of remote display devices as a real-time representation of the parking lot indicating at least vacant parking spaces within the parking lot.

18. The method of claim 17, wherein the parking lot occupancy data corresponds to a plurality of parking lots.

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19. The method of clam 17, wherein the real-time representation indicates locations of occupied parking spaces.

20. The method of clam 17, wherein the real-time representation indicates locations of reserved parking spaces.

ABSTRACT OF THE INVENTION

A server transmits parking lot occupancy information over the Internet. Such parking lot occupancy information is capable of being reproduced by a remote display device as a real-time representation of the parking lot indicating vacant parking spaces. The real-time representation may be in the form of a textual listing, a graphical map, a video image, an Internet Web page or similar form. When presented with the real-time representation of the parking lot, a commuter can readily locate an available parking space or decide to search for parking elsewhere.

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STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR	Docket Number (Optional)

Applicant, Patentee, or Identifier: Robert Vincent Racunas, Jr.

Application or Patent No.: _____

Filed or Issued: _____

Title: Internet Communication of Parking Lot Occupancy Information

As a below named inventor, I hereby state that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

☒ the specification filed herewith with title as listed above.

☐ the application identified above.

☐ the patent identified above.

I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

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☒ No such person, concern, or organization exists.

☐ Each such person, concern, or organization is listed below.

Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

Robert Vincent Racunas, Jr		
NAME OF INVENTOR	NAME OF INVENTOR	NAME OF INVENTOR
Robert Vincent Racunas, Jr.		
Signature of inventor	Signature of inventor	Signature of inventor
September 28, 1999		
Date	Date	Date

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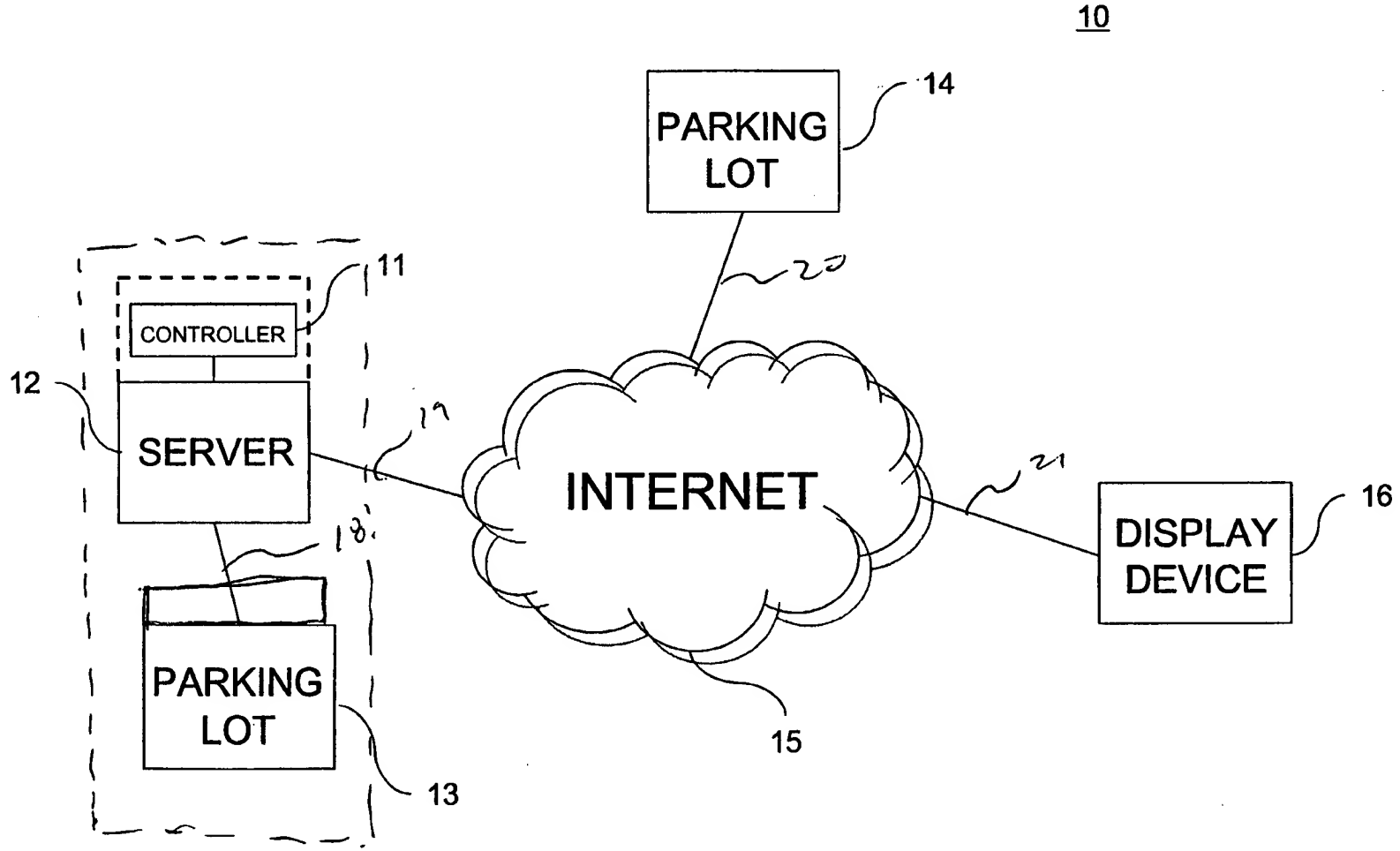

FIGURE 1

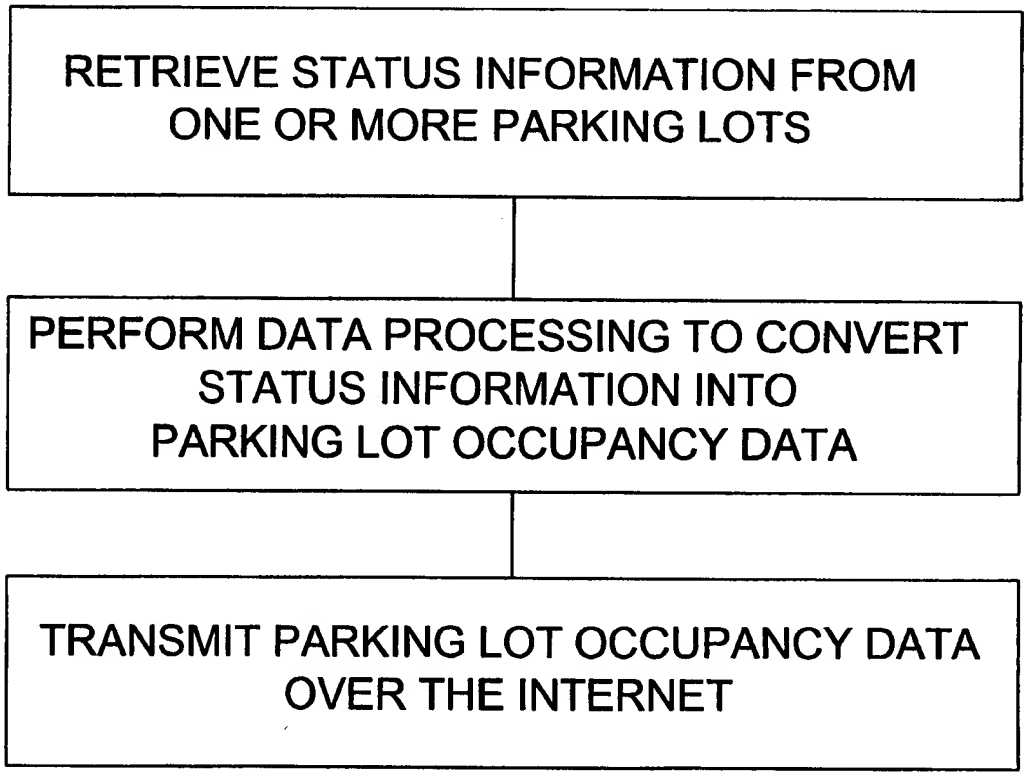
RETRIEVE STATUS INFORMATION FROM ONE OR MORE PARKING LOTS
S10
PERFORM DATA PROCESSING TO CONVERT STATUS INFORMATION INTO PARKING LOT OCCUPANCY DATA
S20
TRANSMIT PARKING LOT OCCUPANCY DATA OVER THE INTERNET
S30

FIGURE 2

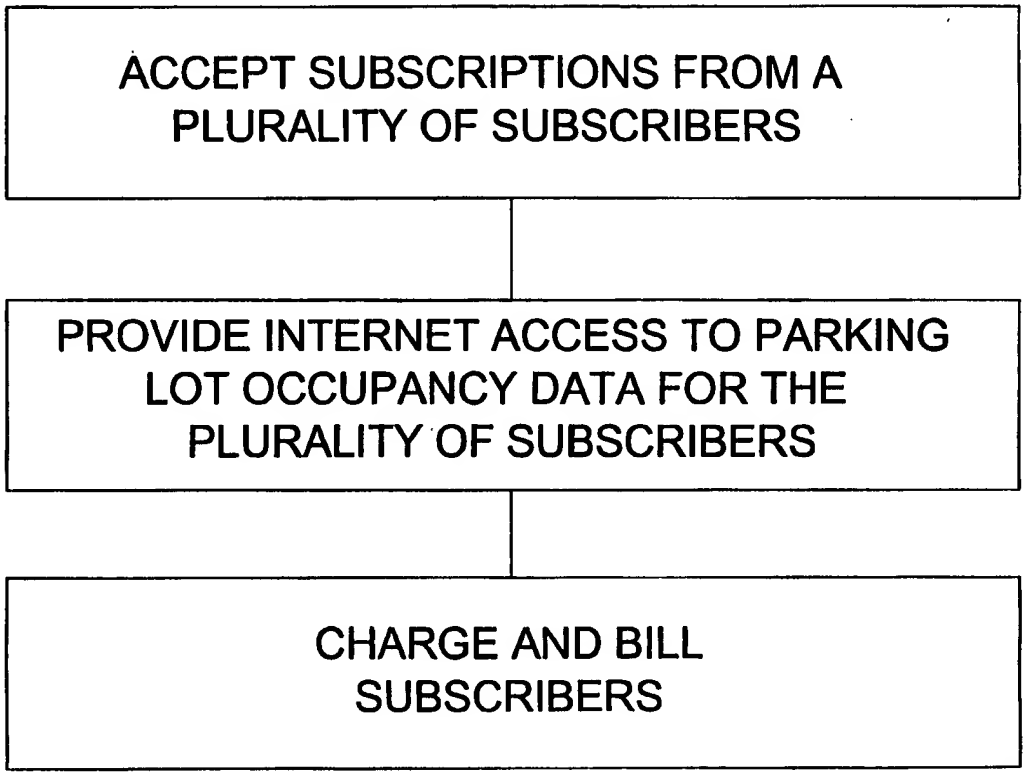
ACCEPT SUBSCRIPTIONS FROM A PLURALITY OF SUBSCRIBERS
S100
PROVIDE INTERNET ACCESS TO PARKING LOT OCCUPANCY DATA FOR THE PLURALITY OF SUBSCRIBERS
S200
CHARGE AND BILL SUBSCRIBERS
S300

FIGURE 3